Space Weather Forecast

Issued on Friday 8 November 2024 at 13:20 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity with a chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with several Moderate-class flares. These flares have predominantly originated from a moderately sized but magnetically complex region near centre disc, along with another moderately sized region in the far southeast of the visible disc.

There are currently eight sunspot regions on the visible disc. The three most actively flaring regions, including the two aforementioned regions, lie in the southern hemisphere but close to the solar equator. The other regions are smaller or magnetically simple, and generally either stable or showing only limited change.

No Earth directed CMEs (Coronal Mass Ejections) were observed in available imagery. However, a CME that left the Sun on 05 Nov may have given the Earth a very slight and glancing blow around 08/1030 UTC.

Solar Wind / Geomagnetic Activity: Solar winds were initially at slightly elevated levels of 400-420 km/s following CME enhancement on 07 Nov. Winds gradually declined to background by around 07/1900 UTC and were steadily around 350 km/s for much of the period. Since 08/1030 UTC a slight uptick in winds has been observed, with speeds now around 380 km/s. The Interplanetary Magnetic Field was Weak, but has increased since around 08/1000 UTC and is currently Strong. The important north-south component varyied weakly between positive and negative directions, but has been predominantly positive since 08/0000 UTC and recently reached Moderate levels. Geomagnetic Activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is forecast to continue, with occasional Moderate-class flares expected and a chance of isolated Strong flares, with the regions located in the southern hemisphere considered the most likely sources.

Solar Wind / Geomagnetic Activity: A minor CME enhancement is thought to currently being observed at Earth following a glancing blow, with any influence expected to wane by the end of

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Day 1 (08 Nov).

A weak enhancement to solar wind speeds is considered probable later today (08 Nov) or during Day 2 (09 Nov) associated with a stream of solar winds from a coronal hole. Speeds may reach Slightly elevated wind speeds of 400-450 km/s at peak. This may be masked by the slight enhancement from the CME glance. There is a chance for further possible coronal hole influence to bring Slightly elevated or Elevated levels later Day 2 or Day 3 (10 Nov) but this is lower confidence.

Mainly Quiet to Unsettled (Kp 0-3) activity is expected, but with isolated Active (Kp 4) intervals likely due to occasional solar wind enhancements and, on Day 1, the CME influence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is at background levels. There is a slight chance of S1/Minor Proton Storms or greater on Days 1-2 (08-09 Nov), rising to a chance from Day 3 (10 Nov) as the significant regions on the facing-disc rotate into more geoeffective positions.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	15	20	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	80	80	80
Very Active	R3-R5 (X Class)	No	20	20	20	20

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	20	25
Very Active	**≥ S3 ***	No	1	1	1	0
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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